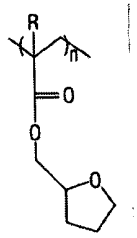
WHAT IS CLAIMED IS:

1. An oxygen scavenging composition, comprising:

an oxygen scavenging polymer comprising units having structure I:



(I)

wherein R is selected from the group consisting of -H and -C_1-C_6 alkyls and n is an integer greater than or equal to 1; and

an oxidation catalyst.

2. The oxygen scavenging composition of claim 1, wherein the oxygen scavenging polymer consists essentially of units having structure I.

3. The oxygen scavenging composition of claim 1, wherein the oxidation catalyst is a transition metal oxidation catalyst.

4. The oxygen scavenging composition of claim 3, wherein the transition metal oxidation catalyst is a cobalt salt.

5. The oxygen scavenging composition of claim 4, wherein the cobalt salt is selected from the group consisting of cobalt oleate, cobalt stearate, and cobalt neodecanoate.

6. The oxygen scavenging composition of claim 1, further comprising an energy-absorbing compound selected from the group consisting of microwave reactive materials and photoinitiators having a wavelength of maximum absorption of electromagnetic radiation from about 200 nm to about 750 nm.

7. The oxygen scavenging composition of claim 6, wherein the energy-absorbing compound is a photoinitiator selected from the group consisting of benzophenone derivatives containing at least two benzophenone moieties and having the formula:

$A_a(B)_b$

wherein

A is a bridging group selected from sulfur; oxygen; carbonyl; -SiR"$_2$-, wherein each R" is individually selected from alkyl groups containing from 1 to 12 carbon atoms, aryl groups containing 6 to 12 carbon atoms, or alkoxy groups containing from 1 to 12 carbon atoms; -NR"'-, wherein R"' is an alkyl group containing 1 to 12 carbon atoms, an aryl group containing 6 to 12 carbon atoms, or hydrogen; or an organic group containing from 1 to 50 carbon atoms;

a is an integer from 0 to 11;

B is a substituted or unsubstituted benzophenone group; and

b is an integer from 2 to 12.

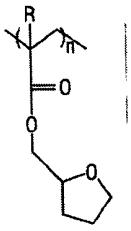
8. The oxygen scavenging composition of claim 7, wherein the photoinitiator is selected from the group consisting of dibenzoyl biphenyl, substituted dibenzoyl biphenyl, benzoylated terphenyl, substituted benzoylated terphenyl, tribenzoyl triphenylbenzene, substituted tribenzoyl triphenylbenzene, benzoylated styrene oligomer, and substituted benzoylated styrene oligomer.

9. The oxygen scavenging composition of claim 1, wherein R is -H and the polymer consists essentially of units having structure I.

10. The oxygen scavenging composition of claim 1, wherein R is -H and the polymer further comprises methyl methacrylate units.

11. A packaging article, comprising:

an oxygen scavenging layer comprising an oxygen scavenging polymer comprising units having structure I:



(I)

wherein R is selected from the group consisting of -H and -C_1-C_6 alkyls and n is an integer greater than or equal to 1; and,

an oxidation catalyst.

12. The packaging article of claim 11, wherein the oxygen scavenging polymer consists essentially of units having structure I.

13. The packaging article of claim 11, wherein the oxidation catalyst is a transition metal oxidation catalyst.

14. The packaging article of claim 13, wherein the transition metal oxidation catalyst is a cobalt salt.

15. The packaging article of claim 14, wherein the cobalt salt is selected from the group consisting of cobalt oleate, cobalt stearate, and cobalt neodecanoate.

16. The packaging article of claim 11, further comprising an energy-absorbing compound selected from the group consisting of microwave reactive materials and photoinitiators having a wavelength of maximum absorption of electromagnetic radiation from about 200 nm to about 750 nm in the oxygen scavenging layer.

17. The packaging article of claim 16, wherein the energy-absorbing compound is a photoinitiator selected from the group consisting of benzophenone derivatives containing at least two benzophenone moieties and having the formula:

$A_a(B)_b$

wherein

A is a bridging group selected from sulfur; oxygen; carbonyl; -SiR"$_2$-, wherein each R" is individually selected from alkyl groups containing from 1 to 12 carbon atoms, aryl groups containing 6 to 12 carbon atoms, or alkoxy groups containing from 1 to 12 carbon atoms; -NR"'-, wherein R"' is an alkyl group containing 1 to 12 carbon atoms, an aryl group containing 6 to 12 carbon atoms, or hydrogen; or an organic group containing from 1 to 50 carbon atoms;

a is an integer from 0 to 11;

B is a substituted or unsubstituted benzophenone group; and

b is an integer from 2 to 12.

18. The packaging article of claim 17, wherein the photoinitiator is selected from the group consisting of dibenzoyl biphenyl, substituted dibenzoyl biphenyl, benzoylated terphenyl, substituted benzoylated terphenyl, tribenzoyl triphenylbenzene, substituted tribenzoyl triphenylbenzene, benzoylated styrene oligomer, and substituted benzoylated styrene oligomer.

19. The packaging article of claim 11, further comprising an antioxidant in the oxygen scavenging layer.

20. The packaging article of claim 19, wherein the antioxidant is selected from the group consisting of 2,6-di(t-butyl)-4-methylphenol(BHT), 2,2'-methylene-bis(6-t-butyl-p-cresol), triphenylphosphite, tris-(nonylphenyl)phosphite, vitamin E, tetra-bismethylene 3-(3,5-ditertbutyl-4-hydroxyphenyl)-propionate methane, and dilaurylthiodipropionate.

21. The packaging article of claim 11, wherein the oxygen scavenging layer further comprises an oxygen barrier polymer selected from the group consisting of poly(ethylene vinyl alcohol) (EVOH), polyacrylonitrile, polyvinyl chloride (PVC), poly(vinylidene dichloride), polyethylene terephthalate (PET), and polyamide.

22. The packaging article of claim 11, further comprising an oxygen barrier layer.

23. The packaging article of claim 22, wherein the oxygen barrier layer comprises poly(ethylene vinyl alcohol) (EVOH), polyacrylonitrile, polyvinyl chloride (PVC), poly(vinylidene dichloride), polyethylene terephthalate (PET), or polyamide.

24. The packaging article of claim 23, wherein the oxygen barrier layer comprises EVOH, and the packaging article further comprises a moisture barrier layer.

25. The packaging article of claim 24, wherein the moisture barrier layer comprises polyethylene, polyethylene terephthalate (PET), or a mixture thereof.

26. The packaging article of claim 11, further comprising a structural layer.

27. The packaging article of claim 26, wherein the structural layer comprises polyethylene, low density polyethylene, very low density polyethylene, ultra-low density polyethylene, high density polyethylene, polypropylene, polyethylene terephthalate (PET), polyethylene naphthalate (PEN), nylon, polyvinyl chloride, ethylene-vinyl acetate, ethylene-alkyl (meth)acrylates, ethylene-(meth)acrylic acid, ethylene-(meth)acrylic acid ionomers, aluminum foil, or paperboard.

28. The packaging article of claim 27, wherein the structural layer comprises PET, aluminum foil, or paperboard.

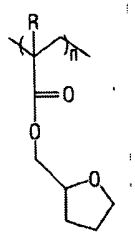
29. The packaging article of claim 11, wherein the oxygen scavenging layer is a liner, coating, sealant, gasket, adhesive insert, non-adhesive insert, or fibrous mat insert in the packaging article.

30. The packaging article of claim 11, wherein the packaging article is in the form of a single layer film, a multilayer film, a single layer rigid article, or a multilayer rigid article.

31. A method of initiating oxygen scavenging by an oxygen scavenging composition, comprising:

(a) providing an oxygen scavenging composition, comprising:

(i) an oxygen scavenging polymer comprising units having structure I:



(I)

wherein R is selected from the group consisting of -H and -C_1-C_6 alkyls and n is an integer greater than or equal to 1;

(ii) an oxidation catalyst; and,

(iii) an energy-absorbing compound selected from the group consisting of microwave reactive materials and photoinitiators having a wavelength of maximum absorption of electromagnetic radiation from about 200 nm to about 750 nm; and

(b) exposing the oxygen scavenging composition to electromagnetic radiation for a duration sufficient to initiate oxygen scavenging by the oxygen scavenging composition.

32. The method of claim 31, wherein the electromagnetic radiation has a peak wavelength from about 50 nm shorter than the wavelength of maximum absorption of the energy-absorbing compound to about 50 nm longer than the wavelength of maximum absorption of the energy-absorbing compound.

33. The method of claim 32, wherein the electromagnetic radiation has a peak wavelength from about 10 nm shorter than the wavelength of maximum absorption of the energy-absorbing compound to about 10 nm longer than the wavelength of maximum absorption of the energy-absorbing compound.

34. The method of claim 31, wherein the oxidation catalyst is a transition metal oxidation catalyst.

35. The method of claim 34, wherein the transition metal oxidation catalyst is a cobalt salt.

36. The method of claim 35, wherein the cobalt salt is selected from the group consisting of cobalt oleate, cobalt stearate, and cobalt neodecanoate.

37. The method of claim 31, wherein the energy-absorbing compound is a photoinitiator selected from the group consisting of benzophenone derivatives containing at least two benzophenone moieties and having the formula:

$A_a(B)_b$

wherein

A is a bridging group selected from sulfur; oxygen; carbonyl; -SiR"$_2$-, wherein each R" is individually selected from alkyl groups containing from 1 to 12 carbon atoms, aryl groups containing 6 to 12 carbon atoms, or alkoxy groups containing from 1 to 12 carbon atoms; -NR"'-, wherein R"' is an alkyl group containing 1 to 12 carbon atoms, an aryl group containing 6 to

12 carbon atoms, or hydrogen; or an organic group containing from 1 to 50 carbon atoms;

a is an integer from 0 to 11;

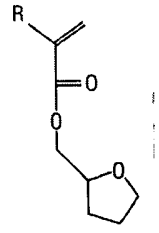
B is a substituted or unsubstituted benzophenone group; and

b is an integer from 2 to 12.

38. The method of claim 37, wherein the photoinitiator is selected from the group consisting of dibenzoyl biphenyl, substituted dibenzoyl biphenyl, benzoylated terphenyl, substituted benzoylated terphenyl, tribenzoyl triphenylbenzene, substituted tribenzoyl triphenylbenzene, benzoylated styrene oligomer, and substituted benzoylated styrene oligomer.

39. A method of producing an oxygen scavenging polymer, comprising:

(a) polymerizing a monomer composition comprising monomers having structure II:



(II)

wherein R is selected from the group consisting of -H and -C_1-C_6 alkyls, to form an oxygen scavenging polymer.

40. The method of claim 39, wherein the monomer composition consists essentially of units having structure II.